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DEMANDS OF HOUR UPON MEDICAL
STUDENT



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UPON THE

Medical Student.

A VALEDICTORY ADDRESS

TO THE

GRADUATING CLASS,

AT THE FIFTH ANNUAL COMMENCEMENT

OF

Charity Hospital Medical College,

BY

L. M. WHITING, M. D.

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LECTURE.

THE occasion which has brought us together here to-day, although regarded with indifference, or, perhaps entirely unrecognized by the multitude who throng round about, is nevertheless one of moment. When a comparatively small number of men are prepared, and with an outfit of the necessary mathematical and other instruments for scientific purposes—of the implements for offense and defense against savage beasts and more savage men—of provision against starvation, and the destructive influence of climatic changes and atmospherically distributed poisons; when a group thus in full panoply, launches forth on a voyage of three, five or ten years, to explore the dark and unknown regions of a far-off continent, all the world is alive to the enterprise. Not a heart of the millions in the enlightened portions of the earth but beats in unison with the laudable ambition animating the bold and public spirited adventurers, and a silent response, at least, is given to the hearty God-speed! which rings out in the cheers of all who watch the gallant band, so long as sight or sound of it remains. And yet, to each individual of our race, who thus participates in the spirit and appreciates the object of the outward bound volunteers, there can scarcely, by possibility, be so much real, personal interest involved, as in the successful prosecution of the aims and purposes which should, and I trust does, inspire the corps of self-sacrificing humanitarians which we here and now convene to cheer on into a life-long struggle with the foes to human health and human happiness. What though the great lords of the Exchange in London, of the Bourse in Paris, the creditors of all the world in Amsterdam, and the “Bulls and Bears” of Wall

Street, may see opening up new and vast sources of cent per cent upon the investment of accumulated hoards, in the discovery of new thoroughfares to myriads of beings with yet undeveloped, silk-adorning, calico-wearing, tobacco chewing, opium-eating, whisky-drinking, and trade-depraving susceptibilities in general ! Not a man of them all but would give up all his hopes of gain, and let every swarthy son and daughter of Ethiopia swelter in all their naked barbarism under a tropical sun as they abuse themselves in fetishism without limit, for one hour of Weber's science and art, to save his own, or the life of a beloved son, when threatened by the presence of a cruel calculus ; or for the deft manipulation of the unerring hand which ministers to the wisdom of Metz's brain to give light in otherwise inevitable blindness. True, there is glory in the discovery of a new range of mountains, navigable river or inland sea, a Gorilla, men with tails, extinct species of animals belonging to far past periods in the life of this planet, but no gorilla ever captured or seen by Du Chaillu in the wilds of Africa can ever equal in interest the hundreds, aye the thousands of that species, which Plato designated as "bipeds without feathers," I trust you, my young brethren, may yet discover, and that, too, without being subjected to so many "hair breadth 'scapes by flood and field," or base suspicions as have befallen the adventurous Frenchman, by being caught so far away from home, on the occurrence of his notorious exploits. We believe that a very large share of the wealth of knowledge in all its departments, has been attained by and through the labor and zeal of men belonging to the profession of medicine, or those intimately associated therewith ; but whether this is so or not, still, outside of the efforts specially directed to the improvement and perfection of the healing art, there have been no discoveries exceeding in importance those belonging to its exclusive domain. And yet, with what wistful, longing eyes are the wisest of our savans gazing into the

misty, aye, dense and dark clouds that brood like night over that vast area, untrodden and unknown, but on the confines of which we stand even now, in the middle of the nineteenth century ! Into this wild, one or more, or all of these recruits, or their like, must enter, if entered at all it ever is, with such imperfect charts and compass as their superiors and predecessors in the Grand Army of Observation can furnish, thence we trust to bring forth treasures in comparison with which the burden of Solomon's heavily laden camels from the land of Ophir were as dross. We will not attempt, however, at present, to cross the barrier which limits the observation of ordinary industry ; but wander with an abandon inexcusable except for invalidism of both body and mind, for a brief space in the field which has been surveyed, sometimes, perchance, peering into some rift or crevice of the wall which divides us from the beyond, and hoping, thus, that some suggestion may be made to some mind with reference to the method of making progress philosophically in such knowledge as is requisite for the " Medicine man " of the day, not unworthy of the hour. There is something of " the forlorn hope " in this, when I know that you have not entered upon the work before you, my young friends, without all the helps which the nature of the case affords. That is, what is known, you have had, or may have access to. In such an institution as you have received the honors of, and of which you may ever proudly boast as your *Alma Mater*, there is no lack of knowledge, so far as the human intellect and human labor has succeeded in developing truth and law ; no lack of effort to impart that knowledge, and no failure to do it in the best possible mode that time and circumstances will permit, and no failure on your part, as your examinations show, to receive, understand, and appreciate largely the great truths which have been established by the careful, patient toil of generations of ceaseless laborers, through centuries of the past. You have learned that in some sense, at least, matter is eternal !

The material of the universe once existent, no jot or tittle is ever lost. And you have learned that at least co-existent with matter is its active principle, or FORCE. You have learned that the everlasting working of that force upon the molecules, or aggregates of particles of matter, has brought out of chaos into form, the firm earth-crust upon which we tread, over an ocean of fire. That it has fashioned the vast continents of our globe, piled masses of rock into colossal mountain-ranges throughout their whole extent, through whose gorges it pours in tumultuous and ceaseless tide the multitudes of waters ever onward to the great receptaculum, the ocean. You have learned that above, around, beneath, whichever way that wonderfully constructed instrument of observation, the eye, turns in its wonderful orbit, there is greeting of bodies of all forms and sizes and colors and consistence; the glorious arch which spans the earth being studded with the brilliant demonstrations of the power and ceaseless activity of this omnipresent spirit of creation to the profound conviction of every observer. But with no more prodigality is this evidence dispensed on high, than in the dark caverns below us, where lie buried treasures no calculation can estimate the value of, and really no more to excite marvel, than in the striking display of gems in the cabinet of the naturalist, or the casket of royalty. You have learned that this same spirit-power, after forcing the molecules of matter to assume certain forms of crystallization and aggregation, proceeds apparently to adorn the still, inert, inorganic waste places of space with wonderful productions, to which, for your amazement is added to a bewildering amount and degree of beauty and grace, something very like its own creative power and wisdom, to wit: the faculty of reproducing itself. Then you came to see and know the miraculous phenomenon of living, sensitive, conscious beings,—the climax of wonders in the sphere of this wonderful potency which pervades the universe. And in this class you found a genus which is the conservator of

all the interests of importance in this world; and it is with this group, that you found it necessary to become familiar, in each particular phase of its complicated nature and relations. The revelations which have been made in reference to the general characteristics of this species of beings, the special organic constitution of the various parts, and the functions of each, and all together, are the combined result of the study, experiment, observation and record of laborers in every department of human knowledge. And to the neophyte the achievements of the past seem like gigantic mountains to a lilliputian dwarf. And the seeming is all reality, too. He finds himself confronted by a grave philosopher as he makes his first step into the temple of mysteries, and from whom he learns that even the mass of the planet on which he lives, in comparison with that of the sun, is of immense importance to vital existence; as this determines the intensity of the force with which all bodies tend toward it; that its form gives direction to that force. He also learns that there is a fundamental equilibrium and regular movement in given directions, to the fluids which cover a large proportion of the earth's surface with which the existence of living beings is intimately associated, and that the dimensions of our planet limits the indefinite multiplication of races, and especially the human. Also, that the distance of it from the centre of our solar system determines chiefly its temperature. The student of medicine finds himself compelled, I say, to go away into these apparently remote regions and considerations, because any sudden change in one or more of these conditions must immensely modify the phenomena of life with which he expects to have constantly the most intimate dealings. Having discovered that these statical data are of so great interest in their bearing upon biological study, he finds, on further search for causes of perturbation in vital phenomena, that the dynamical conditions of astronomy have a yet more important bearing: and that not only the inter-

mittence of the proper animal life, pointed out by Bichat, is subordinate in its periods to the diurnal rotation of our planet, but that the same law applies to all the periodical phenomena of any organism, in both the normal and pathological states; allowance being made for secondary and transitory influences. In fact, that in every organism, the total duration of life, and its chief natural phases, depends on the angular velocity proper to our planet: for, other things being equal, as the vital phenomena succeed each other more rapidly in the animal organism, life must be shorter. If the earth were to rotate much faster, the course of physiological phenomena would be accelerated in proportion: so that the duration of life may be regarded as measured by the duration of the day. Again, if there were to occur a change in the earth's orbit, it would inevitably affect the life of the organism. If the ellipse were to become, instead of nearly circular, eccentric, like that of a comet, both the medium in which we "live and move and breathe," and our organism would undergo a change fatal to vital existence. The inclination of the plane of the orbit of the earth determines the division of the earth into climates, and the alternation of seasons produces a great impression upon the phases of individual existence in all organisms. I take occasion thus to suggest the importance of all biologists informing themselves accurately of the real elements proper to the astronomical condition of our planet; not as an original thought, but because it seems to be too little regarded by students of medicine, as a necessary preliminary of professional education, and because, it seems to be the true mode of obtaining positive knowledge of the phenomena of life. The solar system should be studied first, because the laws of that system determine those of man. Between these two, the laws of physics, and of chemistry interpose, one the complement of Astronomical laws, and the other an immediate preliminary of the

Physiological. Moreover, it is in the knowledge of the relations which exist between our solar system and vital phenomena, that the intelligent physician is able to overthrow all those fanciful notions which prevailed in ancient Philosophy, about the influence of the stars on human destiny, and physiology in general, and which have by no means been extinguished in this day and generation. That an order of primitive celestial conditions affecting biological phenomena exists, is unquestionable. And in order to prevent any vicious or exaggerated notions about the physiological influence of the stars, it is sufficient to know that the astronomical conditions of vital existence are comprised within our own planetary system, and that they relate, not directly to the organism, but to its surroundings, affecting as they do the constitution of our globe. Of course, the acquisition of knowledge in this department, implies previous culture in the mathematics and physics; for it is manifest, that a scientific analysis of the grounds of the permanence of the laws of the limits of variation of the different elements proper to the astronomical constitution of our planet, could not be made without use of the general laws of rational mechanics.

But in moving onward to the study of man, which he regards as his proper subject, or attempting to do so, the student is quietly informed by his mentor, that in order to comprehend the extreme complexity of the phenomena of animal life, and especially human life, he must first master a knowledge of the external world. And here is a long catalogue of 'ologies and 'ographies, involving much patient research, to ascertain the most prominent facts in their sphere. The geological structure of the earth, the materials composing its solid crust, and its vast reservoirs, and streams of liquid masses, all bear, in greater or less degree, upon the grand object of his pursuit. The physical geography of the globe, explaining its great natural divis-

of land and water, the atmosphere which covers them all, the great movements, as of oceanic and ærial currents, the forms of continents, and oceans and their subdivisions, the heights and ranges of mountains, the phenomena of deserts and plains, and all the varying outlines, from the highest mountain peaks to the lowest depths of the sea—the meteorological phenomena of rain, fog, dew, hail, frost, &c., all, all must be more or less perfectly understood, before a near approach is made to the final accomplishment. And how is this to be consummated without the aid of Chemistry? That which constitutes a knowledge of the elements of bodies, their mutual combinations, the forces by which these combinations are brought about, and the laws by which these forces act? And what conceptions can any one have of the anatomical elements, either solid or fluid, or of the products of the organism, without a chemical analysis? After another protracted and pains-taking, preparatory effort, the enquirer is brought to the contemplation of a phenomenon for which he soon learns it has been found a somewhat difficult matter to express a fundamental idea,—but has the general name, *life*. Bichat tells him, life is a struggle between dead nature, and living nature. But it would seem that Comte's criticism upon the irrationality of this conception, holds good; to wit: that it suppresses one of the two elements whose concurrence is necessary to the general idea of life; that this idea supposes, not only a being so organized as to admit of the vital state, but such an arrangement of external influences as will also admit of it; that the harmony between the living being and the corresponding medium or environment, evidently characterizes the fundamental condition of life, whereas, on Bichat's supposition, the whole surroundings of living beings tend to destroy them. It is not my purpose to attempt an exhibition of all the modes which have been adopted to define *life*. But the student will find

many: and mostly will he find vital phenomena referred to the direct agency of a *vital principle*—not as a mere term to denote the unknown cause of vitality, but as a real and complex existence, though profoundly unintelligible. Such was the *archeus* of Van Helmont, the *soul* of Stahl, the *vital principle* of Barthez, and even the *organic sensibility* of Bichat. For, in attempting to explain the successive flow of different liquids through one canal, he says the organic sensibility of the canal was successively in harmony with each fluid, and in antipathy with the rest. Very different is the language of M. de Blainville, in the introduction to his treatise on Comparative Anatomy, where he characterizes *life* as the double interior motion, general and continuous of composition and decomposition. And, however complicated may have been the problems heretofore encountered, those presented in this most mysterious process in every organism, are still more complex, and many, so far as human perception has yet penetrated, absolutely insoluble. But the student does learn that the organic world has natural divisions—animal and vegetable; the naturalness depending upon the fact, that locomotion, (partial at least,) and a corresponding degree of general sensibility, are the predominating and uniform characters of the entire animal series. And he should know each individual reason why the animal kingdom is given precedence in the organic hierarchy, as well as the rational hierarchy of the animal kingdom by itself: that the dignity of animal life, for example, depends not upon abode, mode of nutrition, &c., but upon the greater complexity of organism, its relative perfection, speciality and elevation. He will need to know also the degree of animality proper to the different organs,—the rank of the organs in their relation to life. And now, with a proper knowledge of the exterior conditions of life, which we know are physical and chemical, and involve weight, pressure, motion and rest, thermological action, light, electricity, &c., molecular con-

ditions, air and water, our candidate for a sound and enviable reputation in the ranks of scientific physicians, takes a step forward from the vestibule, and begins to survey the interior of that temple, whose external grace, adornment, and surprising manifestations have so long excited to an intense degree his curiosity, and led him to regard with profound reverence the power which could institute, and keep in constant activity such a marvellous creation. But he finds no oracle within the sacred walls to open the dark recesses of this complex nature with words of talismanic power; and he carries no lamp of Aladdin, which by a gentle brush from the sleeve of his gown, shall light up into full and conspicuous view the grand salient points of interest, which, when fairly seen, reflect upon the soul of the observer flashes of glorious rays, filling it with such ecstatic awe as no diamond from Golconda ever sped through the darkness and gloom of its pre-historic prison-house. Here stands again the same imperturbable but kind master, who with gentle firmness assures the bewildered devotee that steady, patient, unremitting application is the only way to reach the hidden treasures. And so he learns that the simplest notion of life is characterized by the double, continuous motion of absorption and exhalation owing to the reciprocal action of the organism and its environment, and adapted to sustain during a certain time, and within certain limits of variation, the integrity of the organization, and that the result of this is, that every instant of its existence, every living body must present in its structure and decomposition two very different orders of principles; absorbed matters, in a state of assimilation, and exhaled matters, in a state of separation; and that this is the great anatomical distinction between *organic elements* and *organic products*. This distinction being clearly established, he proceeds to the discovery of each anatomical element; that these are both fluid and solid. Here he may be

detained more or less, by the same enquiries which in the bygone times occupied the whole lives of men with eminent name, and who established in their day the triumphant reign of the humoral pathology, thus magnifying the dogma of still more ancient authority, that "in the blood is the life." For instance, the query may arise in his mind, which of the constituents of the blood is the seat of life? water being its chief part, and such an inert vehicle, as to preclude a participation in the life of the fluid. The microscopist tells him, it resides in the globules, which are both organized and living. But as he watches these rolling orbs with unceasing attention, he finds them shrinking more and more as the current flows on through an inferior order of vessels and approaches its incorporation with the tissues; so that at the precise moment of assimilation there is a complete liquefaction of the globules. Hence he is compelled to regard the blood as dying in the very accomplishment of its chief act of vitality. As neither he nor his teacher is able to dissipate the fogs that still hang over the question of the vitality of the fluids, he is carried forward into the study of *tissues*. And he learns there is one primitive and essential web of every organism, and the only one that is present through the whole range of the scale; and its very appearance names it *cellular*. By a close observation of this tissue, it appears as the sole basis of vegetable, and perhaps the lowest animal organization, it being eminently fitted for absorption and exhalation.

Then its characteristic modifications are such as to give us the simple and common structures, as well as the more special and profound. The dermous tissue, for instance, is the basis of the general organic envelope, exterior and interior; and is mere condensation: and by an increasing condensation, several tissues proceed from this, the fibrous, cartilaginous, and bony; the different degrees of condensation dependent manifestly upon the deposition in the

cellular net-work of a heterogeneous substance, which can be extracted, leaving no doubt as to the nature of the tissue. But the observer is astonished to find a more direct condensation of the tissue, combining impermeability and suppleness, without any foreign substance; and capable of holding fluids, whether circulating or stagnant, besides furnishing a perfectly lubricated surface between mobile organs. From this point of enquiry, there appears a new order of transformations; and these distinguish the animal organism, viz.: *the muscular and nervous tissues*, both an anatomical combination of the parent tissue, with a special organic element eminently vital—with the former *fibrine*—the latter *neurine*. How these changes are effected, he does not learn, for all are alike ignorant of the mode of anatomical union of the muscular and nervous tissue with the cellular. But he does learn that the *general position* of these secondary tissues is always related to a modification of the structure itself; the organization of the tissue becoming more special; and elevated exactly in proportion to the deeper position between the exterior and interior surfaces of the animal envelope. And here he has a basis for anatomical analysis, and goes on enquiring into the laws of composition under which the ascent is made from this primary contemplation of the tissues, to that of porous substances, and thence on to that of the organs, thence to the systems of organs, leading on to physiological analysis. In the consideration of animal life, that is, of the phenomena of irritability and sensibility, he finds a wholly different view must be taken from that of inorganic phenomena as no basis of analogy is offered. The double property then of irritability and sensibility is found to be a strictly primitive property of the secondary tissues—the muscular and nervous—and as inexplicable as any other purely fundamental physical property. He has discovered, now, that the animal must first live, in order to move and feel; so that organic life first serves as the basis of the animal, then as its general end

and object. All the general needs of organic life are supplied by the phenomena of sensibility and irritability, and, humiliating as it may seem, even the intellectual and moral functions have usually no other primitive office: so that in the human species, it is only in a high degree of civilization and culture, that the intellect can acquire such a preponderance in the whole organism, as to become the end and object of existence. Of sensibility itself, the student of the present day, finds the great Bichat to have been misled entirely by the limit of explorations in his time: that his assertion that sensibility existed where there were no nerves has been shown to be erroneous, and that the philosophical axiom is nearly or quite established, that nerves are necessary to any degree of sensibility. Of irritability, he also learns, that it is necessarily animal, and requires a corresponding nervous provision; that we can no longer admit that the contractions of the heart, for instance, are determined by the flow of blood toward it. He also finds while in this region, that a dense fog is rising over his sphere of vision, inasmuch as he cannot see anything by which he can determine whether any definite movement is necessarily voluntary or involuntary. And as he passes into a more luminous area, as he thinks, and attempts to compass a knowledge of the phenomena of sensibility known as exterior sensations—as the universal sense of contact or touch, taste, sight and smell—he very soon finds the light insufficient to determine the organic conditions upon which some of the simplest modifications of the phenomena of sight and hearing depend. In regard to sensations which relate to the satisfaction of natural wants, which are so indispensable to the perfection of organic life, the sum of his knowledge must be, that the nervous system is essential to them. In fact, he is now fairly in the region of lights and shadows. In the attempt to analyze and comprehend the mode of action which is common to the phenomena of irritability, he is involved in a maze of theories; and even

the statements of what purport to be facts by various observers, not a little contradictory. The great feature of *intermittence* which characterizes every animal faculty, in contrast with the *continuance* of vegetative phenomena, pointed out by Bichat, applies to all the different degrees of sleep—from simple somnolence to the prolonged torpor of hibernating animals. But the student, after a careful survey of the subject, is pained to learn, that even the organic condition upon which it depends have been subject of the greatest difference in statement; a very large proportion of those making it a special theme, declaring stagnation of venous blood in the brain to be an indispensable preliminary to all extended and durable lethargic states; while only a few amongst the ancients, but more amongst the moderns, seem to believe and justly teach, that no healthy sleep is ever produced in this way. There can be no doubt of the incompleteness of our knowledge in regard to many of the laws in this domain. Still, the thoughtful mind will eventually view it, doubtless, as radically identical with the phenomena of partial repose offered by all the elementary acts of animal life.

The theory of Habit is brought to the notice of our enquirer also; that is, he discovers that these intermittent phenomena can tend to reproduce themselves spontaneously through the influence of a preliminary repetition, prolonged at intervals. But, although this is regarded by many able minds as the basis, of the gradual perfectibility of man, he fails to learn much if anything of the origin of habit, albeit much of those once contracted. The need of activity, which is awakened upon the very existence of an organ is a very important and the most general of the phenomena common to irritability and sensibility. Yet he finds but little to enlighten him as to the analysis of exaggerated action, the varied phenomena of pleasure and pain; physical and moral; or of insufficient action which gives rise to ennui, or to the intermediate degree which constitutes

health, welfare and happiness. He hears much of sympathy, in enquiries after the association of the animal functions, and but little synergy—the one supposing a perturbation which has to be stopped by the intervention of an organ not primarily affected ; the other, the concurrence of two organs simultaneously in the regular accomplishment of any function. He learns that there is agreement amongst the physiologists that the nervous system is the necessary agent of all sympathy. More than this is only a great collection of disjointed facts. As to the mutual association of the different motions, the different modes of sensibility, or the more complex associations between the phenomena of sensibility and irritability, he finds but little that can be set down as *law*. And yet it will probably finally appear that the fundamental unity of the animal organism is a necessary result of a harmony between its various chief functions.

At last, the consideration of what has been characterized the highest kind of living matter, and corresponding force with which we are acquainted, viz. : “Nerve element, and nerve force” carries him into and through the ganglionic cells, and afferent and efferent nerves of the spinal cord, upward to the sensory ganglia at the top of the column, and into the intelligence office of the special senses ; from whence, he is invited fairly into the head-quarters of intellectual and moral phenomena, and required to note well the instrumentalities at work in the nerve centres of ideas.

And here, in the midst of an overwhelming display of developmental force, if he heeds the still small voices which come from the countless myriads of ganglionic cells on every side, from every recess and convolution, he loses all his preconceived or adopted notions of a wonderful entity, denominated and almost worshipped through ages of metaphysics as mind, “an independent source of power, and self-sustaining cause of causes,” and finds the real process in the

production of mental phenomena is one of organization, and conceivable only by the aid of ideas derived from the observation of organic development, viz.: the fundamental ideas of assimilation and differentiation.

In fact, he comes to know, if he can trust the most competent, the most cautious, and the most veracious experimenters, observers, and philosophers of the last two centuries in the domain of physics, of chemistry, of anatomy and physiology, that the entire phenomena of organic life, both animal and vegetable, are resolvable into physiological physics, and physiological chemistry. That respiration, circulation, the development of heat and electricity, digestion, absorption, and secretion, (?) are due to chemical and physical forces. Aye, more: the student of the present generation will probably come to know, if indeed it cannot already be affirmed, that throughout the whole universe, there is one and the same law of development prevailing; that the sun and the stars,—the earth and its minutest microscopic inhabitant,—the mountain and the mouse,—the Leviathan and the tad-pole,—man and the primordial cell from which he springs,—all pass through the same stages of existence; the *embryonic*, or formative;—the stage of growth, or *simple organic*; the *compound organic* or stage of maturity. And further, that the law of *decadence*, is equally inflexible and universal. That from the state of perfection, or maturity, every conceivable existence, organic or inorganic, there is inevitable decline and death. Upon every aspect of everything the human eye or the human intellect can reach in their wide scope of instrumentalities is plainly inscribed, the portentous “Change!” and as the unnumbered millions of forms crowd the tortuous thoroughfares of creation, not one of them but hears and obeys through the everlasting cycles the mandate, “Move On!” from that undying, ever young and vigorous policeman in the domain of matter—force. And he learns, that in each and

all of the countless mutations of form, the agencies that act in effecting the processes known as physical, chemical, vital, physiological, mental and moral, are also the same everywhere throughout nature's vast area—so far as nature is now known. That the heat of the sun of our solar system is the life of every living being within it we may confidently assert now. And are we not equally sure, that the same energy, transformed into motion, light, electricity, magnetism, and chemical affinities, is forever and forever active as the sole force in the production of each and every change in the inorganic world.

Overleaping with a bound, the great extent and variety of special facts and phenomena in bodily alterations, constituting pathology, and the modifiers of action with a knowledge of their use, constituting materia medica and therapeutics, to become familiar with all of which, must occupy with the closest application a long time; especially when we consider the multiplicity of modern chemical and mechanical instrumentalities to be included; we have presented a sort of cursory collation of the curriculum to be regarded as absolutely essential to a philosophical apprehension of the difference between harmony of action in the organism and discord, or decide between normal structure, and morbid alterations, healthy secretions and vicious exhalations. And the intent has been to intimate the nature and extent of the demand, not only in regard to the quality and quantity of acquisition, but as to the method of acquiring, which is made upon the candidate for medical honors, by the corps of educators, who are but the exponents of the written and the unwritten, but inflexible law governing the profession in the present day. And with such requirements faithfully persisted in, may we not triumphantly ask, what are the probabilities in regard to the conservation of the interests of the communities of which these alumni shall become integers, and to whom the people

amongst whom they move must confide the most sacred confidence, and their dearest hopes ! Do not mistake me now, as asserting that every man (or woman) who proclaims himself (or herself), that physician of whom we read, who holds in his beneficent hand from age to age that panacea, "the Balm of Gilead," is possessed of all the knowledge a thorough training here indicated will give. True 'tis pity, and pity 'tis 'tis true that the experience of us all is full of disagreeable and even disgusting exceptions to this rule. Nor would we assume that much learning is the unvarying index of skill and tact in its application to art. We are well aware that in the present state of our knowledge of the laws which govern the relations between physiology, pathology, and the external world, therapeutics cannot be taken out of the rank of an art, and that nothing can be decided in regard to the application of curative agents without the test of experiment and observation. But it is nevertheless true, that as soon as a curative influence upon the altered conditions of the healthy bodily action results in the establishment of general principles, the great practical success of the healing art will depend upon the accuracy with which the precise condition of the organism is made out. And notwithstanding the fact that the use of remedies is but an enlightened empiricism, it seems to me there is a constant approximation toward that period when the *ars medendi* shall be ruled by the *ratio medendi*, or what is equivalent thereto. The accomplishment of this end in the future, appears the more probable when we know that progress is not likely to be interrupted or materially obstructed as heretofore of old, by the dictu of unwarranted authority. So long as the consideration of man took precedence of the study of the external world, so long the phenomena of the universe was attributed to *will*, inside and outside of nature. But direct contact with the universe primarily, brings out the great idea of the *laws* of nature, which involves the whole of phenomena

including man. The attainment of the knowledge that every tissue is organized by the influence of special cells—that in the normal states those permanent tenants and supervisors possess an independent power to take care of themselves (independent of systemic life;) that they feed, digest, assimilate, grow, organize and eliminate in a mode to construct the cells and other products essential to the physiological tissue when supplied with proper and sufficient aliment, has laid the foundations for the positive discovery of the causes of disease: and we can see no reason why the time may not come, when with the use of the experimental method, the accumulation of facts shall be so great in regard to aliments, medicines, and poisons, as to establish a law nearly allied to prevision. But there are demands upon the individual who institutes a claim to public confidence and favor as a physician, growing out of his social relations to the “world’s people.” It has often been suggested, that the public being an ass, any one who will condescend to seize upon its long ears, and throw himself astride the donkey, will, by the administration of the requisite number of *tunks* and thumps and thistles, find himself on the high road to fame and fortune. And really, a superficial observation of even what is called highly civilized society, would seem to go far in sustaining this view. For who does not see every day on our streets many a practitioner of this school “going it” with such pertinacity, and apparent success, as to metamorphose the whole concern into a sort of assinine centaur; so that it is extremely difficult to decide where the ass ends or the doctor begins. The true state of the case, however, seems to be, that great numbers of the people, of this and every other land, are yet in what Dr. Draper calls “the age of faith,” where were a sufficient portion of the population of Europe long ago, to govern it for a thousand years: when if the proof of a statement was required, it was supposed to be furnished by an astounding illustration of some-

thing else. The wager of battle deciding the truth or falsehood of charges assailing the purity of woman, or the honor of men. There is great misconception as to the nature of evidence. But there is a large number of the people also, in the "Age of inquiry," while the fewest are fairly in the "Age of reason." All, however, are so situated, in this country at least, relatively with each other, as to be readily carried by the proper influences from the lower phases upward: so that it would be criminal in the extreme, in any well-informed physician, to minister in any way or for any purpose to the perpetuity of a belief in the miracle cure. For nothing more or less, is the pretension of one and all of that vast army of impostors, who crowd the columns of the daily and periodical press with specious but flagrant falsehoods; and who as traveling charlatans, like mountebanks, thieves and robbers, infest every land, where the minions of law do not catch and hang, or otherwise disable for their ignoble and vicious deeds.

It becomes the duty, then, of the man who enters the profession of medicine, to impress his image and super-scription upon the people with whom he is identified; convincing them logically and by actual demonstration that the malign practices which induce sickness, epidemics and plagues, are not to be referred to supernatural agencies, or as of old, to the anger of some offended God; but that under such visitations, instead of looking for relief by penance and supplications, the sufferers must expect salvation through self-reliant effort,—rigorous personal cleanliness, fresh air, light, and such other means as are based upon the requirements of a healthy body. But in the struggle for existence, which Darwin tells us every living being is obliged, by the very laws of his being and his surroundings to maintain, until it is thoroughly competent to assert its independence, (which we know is true so far as doctors are

concerned,) this cannot be effected without untiring industry, and many sacrifices. It will not do to trust to the faith of the multitude in your *words* of wisdom alone. When some Tentonic household is slowly melting away, as one after another is laid beneath the clods of the valley, his Celtic neighbor will hardly credit the statement, that their stalwart forms have all been carried off by a few millions of invisible devils who took possession of them, because they indulged in a slice or two of raw ham, or heightened their relish for lager, by a few yards, more or less, of half-cooked Bologna sausage. But where is such a dolt as not to heed the warning a full view of the serried hosts of that invading army of trichines through a microscope would give? Speaking of this wonder-working instrument suggests, that it seems really imprudent for any one to go out into the world, especially on a healing mission, without a good one; for there is even danger in planting one's foot down in any new location, especially here in the West, without a sharp lookout for secret foes. And without a knowledge of what is transpiring in that region which Dr. Chalmers calls the "infinity of minnitude," by the use of the microscope—as the telescope seeks the "infinity of magnitude"—in his morning walk looking for malaria the unsuspecting victim would be enveloped in a great invisible cloud of poisonous cryptograms at every step, and some lynx eyed competitor would soon awake him to the consciousness that he has been converted into a vast hot-bed of Palmullæ shores, and no longer of much use but to furnish experiment for the cunning specialist.

There is a demand upon the physician for *integrity*. Pure and unsullied as the driven snow, must be the record of him who ministers at the altar in the sanctum sanctorum of humanity. "Clean hands and a pure heart" are as essential for the blessing of the Lord to-day, as in the days of David. It is written, "resist the devil, and he will flee

from thee ;” and whether he appears to us with diabolical intent upon the public weal in that most contemptible, little, infinitesimal wisp, Homeopathy, or in that blustering, boasting, braggart, bastard Eclecticism, swelling with the eminence of bulk, or in any of the hateful or seductive forms of sin, let us fight the good fight manfully and acquit ourselves like men in the warfare to which we are as if conscript and consecrated, and which lies ahead of you, my young friends. Consult the eternal oracles, not yet inaudible nor ever to become so, when worthily enquired of; and disregard nearly altogether, in comparison, the temporary noises and menacings, and deliriums. May you love wisdom, as wisdom, if she is to yield her treasures, must be loved, piously, valiantly, humbly, beyond life itself, or the prizes of life, with all one’s heart and all one’s soul. In that case, and not any other case, it shall be well with you.



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